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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR    | ATTORNEY DOCKET NO.      | CONFIRMATION NO.       |
|--|-------------|-------------------------|--------------------------|------------------------|
| 10/587,954   | 08/01/2006  | Darrell Grayson Higgins | 06036                    | 5700                   |
| 24386  | 7590        | 06/25/2007              |                          |                        |
| ROBERT W PITTS<br>PO BOX 11483<br>WINSTON-SALEM, NC 27116-1483 |             |                         | EXAMINER<br>HUYNH, HAI H |                        |
|  |             |                         | ART UNIT<br>3747         | PAPER NUMBER           |
|  |             |                         | MAIL DATE<br>06/25/2007  | DELIVERY MODE<br>PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/587,954

Applicant(s)

HIGGINS, DARRELL GRAYSON

Examiner

Hai H. Huynh

Art Unit

3747

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 50-69 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 50-56 and 58-69 is/are rejected.
- 7) ☒ Claim(s) 57 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 8-1-06.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 50-56 are rejected under 35 U.S.C. 102(b) as being anticipated by Waissi (5,402,755).

Waissi teaches a rotating disk 3 positioned in the housing compartment, the rotating disk being located adjacent to the slide body and being rotatable about an axis generally perpendicular to linear reciprocal movement of the slide body, wherein the slide body and the pistons 1 comprise a one-piece rigid body; interengaging members on the slide body and rotating disk 3 sufficiently laterally offset from the axis of rotation of the rotating disk to impart rotary motion to the rotating disk as the slide body linearly reciprocates within the housing compartment and a drive shaft 2 extending through the housing, rotation of the rotating disk being transmitted to the drive shaft so that linear motion of the slide piston is transmitted through the rotating disk to the drive shaft for delivering external power.

3. Claim 50 is rejected under 35 U.S.C. 102(b) as being anticipated by Collins (1,579,083).

Collins teaches a rotating disk W positioned in the housing compartment, the rotating disk being located adjacent to the slide body (R, R') and being rotatable about an axis generally perpendicular to linear reciprocal movement of the slide body, wherein the slide body and the pistons (P, P') comprise a one-piece rigid body; interengaging members on the slide body and rotating disk 3 sufficiently laterally offset from the axis of rotation of the rotating disk to impart rotary motion to the rotating disk as the slide body linearly reciprocates within the housing compartment and a drive shaft S extending through the housing, rotation of the rotating disk being transmitted to the drive shaft so that linear motion of the slide piston is transmitted through the rotating disk to the drive shaft for delivering external power.

4. Claims 58-59 are rejected under 35 U.S.C. 102(b) as being anticipated by Hawkins (6,183,388).

Hawkins teaches a plurality of gear bearings (27, 55), each gear bearing having an upper and a lower conical surface, with a series of gear teeth (52, 54, 29, 30, ) circumferentially disposed between the upper and lower conical surfaces; linear gears oppositely disposed on the first and second members, the gear teeth on each gear bearing engaging the linear gears; and inclined surfaces extending above and below the linear gears, the conical surfaces on the gear bearings being juxtaposed to the inclined surfaces as the gear bearings rotate relative to the first and second members (see Figures 3, 5, 6).

***Claim Rejections - 35 USC § 103***

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5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 60-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waissi (5,402,755) in view of Bois (3,200,800).

Waissi teaches the claimed invention except for a slide body including at least six pistons. Bois teaches a slide body including at least six pistons. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the slide body having six pistons on the double-headed piston of Waissi as taught by Bois in order to improve the power output.

7. Claim 63-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waissi (5,402,755) in view of Gernandt et al (2,387,143).

Waissi teaches the claimed invention except a valve cam shaft extending parallel to the linear movement of the pistons and rotating in response to movement of the linearly reciprocal pistons; a drive gear on the valve cam shaft engaging the rotating gears to cause the protruding cam surface to open and close the valves as the valve cam shaft rotates during cyclical movement of the pistons.

Gernandt et al teach the arrangement in the same manner as claimed.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the valve cam shaft on the system of

Waissi as taught by Gernandt et al in order to prevent reduction in power output of the engine.

***Allowable Subject Matter***


8. Claim 57 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai H. Huynh whose telephone number is (571) 272-4844. The examiner can normally be reached on Monday through Thursday from 7:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Cronin can be reached on (571) 272-4536. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Hai H. Huynh  
Primary Examiner  
Art Unit 3747